What is claimed is:

1. A heat sink for heat generating devices comprising:

a heat conducting body having a base plate for placement in heat conducting relationship with the heat generating device and a plurality of spaced apart heat conducting flow augmenting rings with at least one air pumping aperture between the rings;

a main air flow passageway extending through said spaced apart rings and being sized to receive an axial fan with propeller blades extending towards a radially inward edge of the flow augmenting rings to deliver a main flow of air in an axial direction along said main air passageway and with a gap between the propeller blades and the inner radial edge of the rings selected to enable production of tip vortices from the propeller tips; and with the average ring chordal dimensions being effectively selected with respect to a radial dimension of the main air flow passageway so as to enable tip vortices from the propeller blades to be converted to useful air flow along said axial direction with a radially inwardly induced air flow between and over heat conducting flow augmenting rings that is a significant portion of the total mass flow generated along said main air flow passageway

said rings being in heat conducting relationship with said base plate so as to transfer heat from the base plate to said heat conducting flow augmenting rings;

the axial width of said air pumping aperture between axially adjacent heat conducting flow augmenting rings being selected so as to enable said tip vortices to extend into the aperture and impinge upon radially inner regions of the rings and produce an annular area on at least one of said rings having a heat transfer coefficient H_c of at least about 75 Watts/m^2/°C; so as to impart to said heat sink with said flow augmenting rings a high overall heat transfer characteristic H_c;

whereby the thermal resistance of said heat sink, when combined with said axial fan within th main air flow passageway, is reduced to a sufficiently low level so as to significantly enhance th removal of heat from said heat generating device.

2. The heat sink as claimed in claim 1 wherein said axial width between flow augmenting rings and the average ring chordal dimension are selected so as to impart to the combination of said heat sink and said flow augmenting rings an overall heat transfer coefficient H_c that is at least above about 50 watts/m^2/°C.

3. The heat sink as claimed in claim 1 wherein said axial width between said flow augmenting rings and the average ring chordal dimension are selected so as to impart to the combination of said heat sink and said flow augmenting rings an overall heat transfer coefficient ~~H°~~ H_c which is at least above about 75 watts/m^2/°C.

4. The heat sink as claimed in claim 1 wherein said heat conducting body further comprises an air pumping aperture having an axial width sufficient to enable the radial inflow of air to comprise at least about twenty percent of the mass flow through said main air passageway.

5. The heat sink as claimed in claim 1 wherein said heat conducting body comprises a metal extrusion formed of said base plate, and at least one heat conducting column extending from said base plate and with said flow augmenting rings supported by said heat conducting column.

6. The heat sink as claimed in claim 1 wherein said heat conducting flow augmenting rings extend from said base plate.

7. The heat sink as claimed in claim 1 wherein said heat conducting body has end located columns extending from said base plate and connected to said flow augmenting rings which ar susp nded b tween the nd located columns.

8. The heat sink as claimed in claim 7 wherein said end located columns are elongate substantially solid walls.

9. The heat sink as claimed in claim 1 wherein said heat conducting body has spaced apart heat conducting columns extending up from said base plate wherein each column is connected to a portion of said flow augmenting rings which extend outwardly from said columns in cantilever fashion.

10. The heat sink as claimed in claim 9 wherein said columns are located along at least one dimension of said base plate at a generally central region so as to enable said columns to be in proximity of heat coupled to the base plate from a heat generating device underneath a central part of the base plate.

11. The heat sink as claimed in claim 1 wherein said base plate has first and second columns extending upward therefrom respectively at different sides of the main air flow passageway and wherein said flow augmenting rings extend in opposite directions in cantilever fashion from said columns around said main air flow passageway.

12. The heat sink as claimed in claim 9 wherein said flow augmenting rings and said base plate have a rectangular perimeter.

13. The heat sink as claimed in claim 9 wherein said heat conducting columns are elongate plates and are in alignment with each other.

14. The heat sink as claimed in claim 1 and further including undulating heat conducting elements interconnecting adjacent rings and having passages to enable said radial air flow through th passages.

15. The heat sink as claimed in claim 1 wherein said flow augmenting rings are formed of a multifolded heat conducting material.

16. A heat sink for removing heat from heat generating devices comprising:

a heat conducting body having a base plate for placement in heat conducting relationship with the heat generating device and a plurality of spaced apart heat conducting flow augmenting rings with at least one air pumping aperture between the rings; at least one elongate column affixed to said base plate and coupled to support said flow augmenting rings above said base plate so as to transfer heat from the base plate to said heat conducting flow augmenting rings;

a main air flow passageway extending through said spaced apart flow augmenting rings;

an axial fan sized to fit inside the main air flow passage way and having propeller blades which extend towards a radially inward edge of the flow augmenting rings to deliver a main flow of air in an axial direction along said main air passageway and with a gap between the propeller blades and the inner radial edge of the rings selected to enable production of tip vortices from the propeller tips;

the axial width of said air pumping aperture between axially adjacent heat conducting flow augmenting rings being selected so as to enable said tip vortices to extend into the aperture and impinge upon radially inner portions of the rings and with the average plate chordal dimensions being effectively selected with respect to a radial dimension of the main air flow passageway so as to enable tip vortices from the propeller blades to be converted to useful air flow along said axial direction with a radially inwardly induced air flow between and over heat conducting flow augmenting rings so as to impart to said heat sink with said flow augmenting rings a high overall heat transfer coefficient H_c;

whereby the thermal resistance of said heat sink, when combined with said axial fan within the main air flow passageway, is reduced to a sufficiently low level so as to significantly enhance the removal of heat from said heat generating device.

17. The heat sink as claimed in claim 16 wherein the axial spacings between the flow augmenting rings are selected to enable said tip vortices to radially extend up to about one quarter of the length of the fan propeller radius into the axial spacings.

18. The heat sink as claimed in claim 16 wherein said wherein the axial width of said pumping aperture between flow augmenting rings and the average plate chordal dimension are selected so as to impart to the heat conducting body an overall heat transfer coefficient H_c that is at least above about 75 watts/m^2/°C.

19. The heat sink as claimed in claim 16 wherein said flow augmenting rings are suspended from said column in cantilever fashion.

20. The heat sink as claimed in claim 19 wherein said heat conducting body has spaced apart heat conducting columns extending up from said base plate and wherein each columnar plate is connected to a portion of said flow augmenting rings which extend outwardly from said columnar rings in cantilever fashion.

21. The heat sink as claimed in claim 16 wherein axial spacings between adjacent rings are selected so that tip vortices can radially penetrate to a sufficient extent so as to impart to inner radial regions of said rings on which the tip vortices impinge a heat transfer coefficient H_c of at least about 75 watts/m^2/°C.

22. The heat sink as claimed in claim 21 wherein the heat transf r coefficient of said inner radial regions exceeds 100 watts/m^2/°C.

23. A method for removing heat from a heat generating device comprising the steps of:

embedding a rotating fan having axially extending propeller in a heat sink having a plurality of surrounding flow augmenting rings;

conducting heat from the heat generating device to the flow augmenting rings;

directing tip vortices from the propeller onto radially inner regions of the rings so that these inner regions are cooled by the tip vortices and by an induced radially inward flow through the spacing between flow augmenting rings so as to impart to said inner regions a heat transfer coefficient that exceeds about 75 watts/m^2/°C.

24. The method as claimed in claim 23 wherein said step of directing tip vortices comprises generating a sufficient stream ot tip vortices onto said inner ring regions so as to impart a heat transfer coefficient to said inner ring regions that exceeds about 100 watts/m^2/°C.

25. The method as claimed in claim 23 wherein said tip vortices directing step comprises the step of directing the tip vortices to extend into the axial ring spacings sufficiently to remove a significant amount of heat from inner ring regions for a measurable radial distance that is about 25% of the radius of the propeller.

26. A heat sink for heat generating devices comprising:

a heat conducting body having a base plate for placement in heat conducting relationship with the heat generating device and a plurality of spaced apart heat conducting flow augmenting rings with at least one air pumping aperture between th rings;

a main air flow passageway extending through said spaced apart rings and being sized to r ceiv an axial fan with propeller blad s extending towards a radially inward edg of th flow augm nting rings to deliver a main flow of air in an axial direction along

said main air passageway and with a gap between the propeller blades and the inner radial edge of the rings selected to enable production of tip vortices from the propeller tips; and with the average ring chordal dimensions being effectively selected with respect to a radial dimension of the main air flow passageway so as to enable tip vortices from the propeller blades to be converted to useful air flow along said axial direction with a radially inwardly induced air flow between and over heat conducting flow augmenting rings;

said rings being directly coupled to extend from said base plate so as to transfer heat therefrom;

the axial width of said air pumping aperture between axially adjacent heat conducting flow augmenting rings being selected so as to enable said tip vortices to extend into the aperture and impinge upon radially inner regions of the rings;

whereby the thermal resistance of said heat sink, when combined with said axial fan within the main air flow passageway, is reduced to a sufficiently low level so as to significantly enhance the removal of heat from said heat generating device.

27. A heat sink for heat generating devices comprising:

a heat conducting body for placement in heat conducting relationship with the heat generating device and a plurality of spaced apart heat conducting flow augmenting rings with at least one air pumping aperture between the rings;

a main air flow passageway extending through said spaced apart rings and being sized to receive an axial fan with propeller blades extending towards a radially inward edge of the flow augmenting rings to deliver a main flow of air in an axial direction along said main air passageway and with a gap between the propeller blades and the inner radial edge of the rings selected to enable production of tip vortices from the propeller tips; and with th average ring chordal dimensions being effectively selected with respect to a radial dim nsion of th main air flow passag way so as to enabl tip vortices from the propell r blades to be converted to useful air flow along said axial direction with a

radially inwardly induced air flow between and over heat conducting flow augmenting rings;

a heat conducting column in the form of a cooling pipe for heat conducting relation ship with said heat generating device and coupled to support said flow augmenting rings and transfer heat thereto;

the axial width of said air pumping aperture between axially adjacent heat conducting flow augmenting rings being selected so as to enable said tip vortices to extend into the aperture and impinge upon radially inner regions of the rings;

whereby the thermal resistance of said heat sink, when combined with said axial fan within the main air flow passageway, is reduced to a sufficiently low level so as to significantly enhance the removal of heat from said heat generating device.

28. The heat sink as claimed in claim 27 wherein said cooling pipe is a heat pipe.

29. The heat sink as claimed in claim 28 wherein said cooling pipe comrises a thermoelectric cooling column.